EVALUATION OF FACTORS EXPLAINING RELATIVE LYMPHOCYTOSIS IN MALNOURISHED PATIENTS WITH EATING DISORDERS

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Introduction: The scientific literature describes relative lymphocytosis as a feature of patients with eating disorders (ED). It seems to occur as an adaptive mechanism triggered by this particular status of malnutrition. Leptin, involved in energy balance and immune stimulation might act as a mediator.

Objective: This study was aimed to find out whether malnutrition (BMI Z-score), diagnostic subtype and/or leptin have the biggest influence on the relative lymphocytosis of ED patients.

Methods: 66 ED patients aged 12-17 yr. were studied: 40 anorexia nervosa (AN)-restricting type, 9 AN-binge/purging type, 17 with ED not otherwise specified (EDNOS). WBC counts and profile were assessed in an automated cell counter. Leptin was measured in fasting blood samples by Luminex xMAP technology. Univariate general linear model was used to assess the effect of the diagnostic subtype and BMI Z-score (as continuous variable) on hematological parameters. The basic model included age as a covariate and the model was further adjusted with leptin as an additional covariate. Bivariate and age-adjusted partial correlations were also performed.

Table 1. Descriptives and leptin

	Mean ± SD
Age (years)	14.62±1.38
BMI (Kg/m²)	16.04±1.86
Leptin (pg/mL)	1,852±1,871

Results: BMI Z-score had a significant effect on lymphocyte and monocyte percentage (p= 0.028 and p= 0.069, respectively); the diagnostic subtype had a significant effect only on monocyte percentage (p= 0.027) (Table 2). When leptin was used as an additional covariate in the model both leptin (P=0.006) and BMI Z-score tertile (P=0.036) significantly explained lymphocyte percentage variability (Table 3). The highest to lowest BMI Z-score tertiles showed the following lymphocyte percentage values (mean±SD): 37.6±10.1, 36.9±8.9 and 42.01±9.0, respectively. Lymphocyte percentage showed a negative, age-adjusted correlation with BMI Z-score (r= -0.303; P=0.014) (Figure 1) and leptin (r= -0.428; P=0.002) (Figure 2). Adjusting by age significantly increased the correlation between BMI Z-score and lymphocyte percentage. On the other hand, the effect of leptin was more significant than that of BMI Z-score to explain lymphocyte percentage variation.

Table 2. Effect of diagnostic subptype and BMI Z-score on hematological parameters

	EDNOS	ANP	ANR	$P_{Subtype}$ #	$P_{BMI\ Z\text{-}score}$ †
Leucocyte (x10³ cel./µl)	6.02±2.01	5.35±0.98	6.08±1.54	NS	NS
Lymphocyte (%)	37.12±11.98	37.04±9.99	40.00±8.16	NS	0.028
Neutrophils (%)	52.00±12.98	48.01±11.23	50.34±8.64	NS	NS
Monocytes (%)	4.40±1.200	5.56±2.90	4.10±1.04	0.027	0.069
Basophils (%)	0.79±0.32	1.08±0.57	0.90±0.38	NS	NS

General linear model. Effect of the diagnostic subtype adjusted by age and BMI Z-Score.

† General linear model. Effect of the covariable BMI Z-Score in the model.

Fig. 1 and Fig. 2. Dispersion graphs showing linear regression and Pearson's correlation coefficients (r)

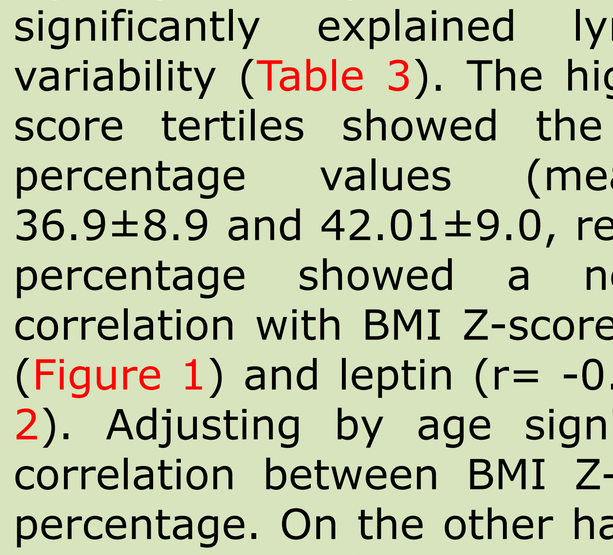

Fig.1

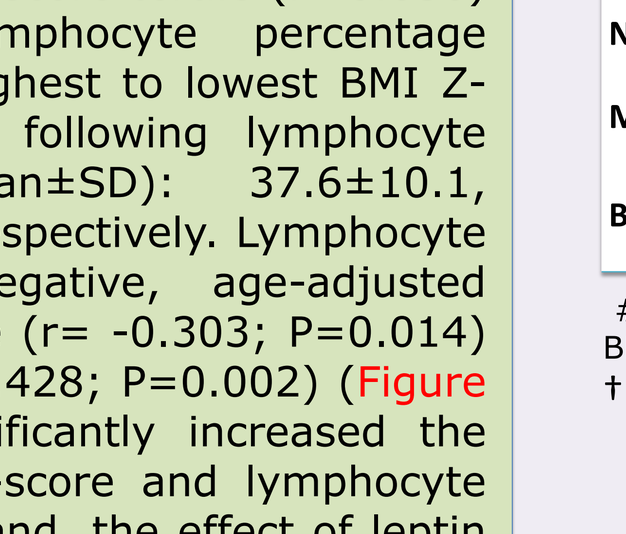

Fig.2

Table 3. Univariate general linear model with fixed factors "diagnostic subtype" and "BMI Z-score tertile" and adjusted by age and leptin.

Test of Between-Subjects Effects					
Dependent variable: Lymphocyte %					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1581.536[a]	9	175.726	2.389	0.029
Intercept	747.442	1	747.442	10.161	0.003
Age	6.458	1	6.458	0.088	0769
Leptin	615.803	1	615.803	8.371	**0.006**
Diag. subtype	52.514	2	26.257	0.357	0702
BMI Z-scr. Tertile	530.962	2	265.481	3.609	**0.036**
Diag subtype * BMI Z-scr. Tertile	122.571	3	40.857	0.555	0.648
Error	2942.483	40	73.562		
Total	79258.438	50			
Corrected total	4524.019	49			
a. R Squared = 0.350 (Adjusted R squared = 0.203)					

Conclusion: The increase in lymphocyte percentage observed in ED patients is more related to the malnutrition status rather than the diagnostic subtype. Leptin seems to be a key mediator in this relationship.

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